

Should reporting programmes talk to each other?

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Introduction

- ☞ Three flight operations safety programmes – ASR, FDR (FOQA) and HFR
- ☞ Compare and contrast ASR and HFR incident reporting programmes
- ☞ Focus on the ‘go-around’ manoeuvre to show how the two programmes can offer distinct but complementary aspects of safety problems.

What's a Go-around?

- A manoeuvre in which a pilot aborts an intended landing on final approach
- Costs money, causes delays, frightens passengers
- Mostly related to traffic density and weather
- Also caused by pilot misjudgement
 - Low frequency of G/As means low level of practice at the manoeuvre
 - In BA a possible training issue

The Issue

- ☞ Three programmes that don't talk to each other
- ☞ For certain types of events FDR has different threshold criteria from ASR, e.g., alt busts
- ☞ ASR and HFR generally deal with same incidents but Flight Operations have no access to HFRs
- ☞ Makes it difficult to evaluate the extent and cause of a problem
- ☞ - and makes it difficult to solve the problem.

FDR – Flight Data Recording

- 1000's of data channels sampled / recorded
- Data concerns technical and flight parameters
- Excellent feedback on engineering systems performance and status
- Flight path monitored continuously for abnormal / unusual flight status
- All data is anonymous – no crew names recorded
- Excellent feedback on crew training and standards
- BUT – dialogue with ASR / HFR is impossible.

ASR - Air Safety Reporting

- Mandatory open reporting and data collection
- Clear reporting criteria, State MOR
- Ability to portray safety trends
- Identify hazards and assess risk
- BA's fundamental safety metric
- 8500 reports per annum
- Feedback to the reporter, community & CAA.

HFR - Human Factors Reporting

- 👉 Confidential reporting and data storage
- 👉 Reporting is voluntary
- 👉 Identifies 'issues'
- 👉 Causal analysis
- 👉 No risk assessment
- 👉 Feedback to the reporter & community.

ASR versus HFR

ASR

- ➡ is mandatory
- ➡ is public
- ➡ asks What?
- ➡ analyses incidents

Outcome

HFR

- ➡ is voluntary
- ➡ is confidential
- ➡ Why? & How?
- ➡ analyses situations

Process

vs.

HFR Analysis

- Explanatory Human 'Factors'
 - not technical 'Keywords'
- Factors describe **Crew Behaviour** and the **Influences** on crew behaviour
- Analysis focuses on **Positive** as well **Negative** safety behaviour and influences
- Graphically maps the chains of **cause and effect** within an event
- Establishes common failure modes and recovery / prevention activities.

Factor Categories

Crew behaviour

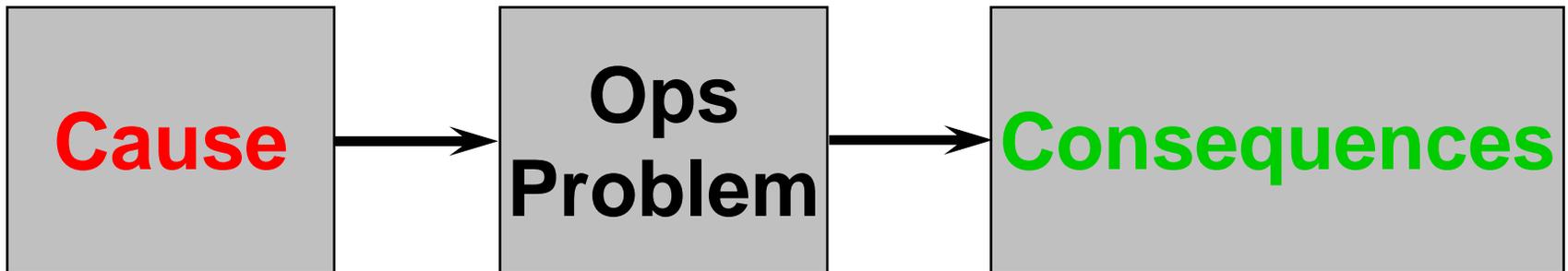
- ☞ What & How?
- ☞ CRM Teamskills
- ☞ Errors & Violations
- ☞ Handling Skills

Behavioural influences

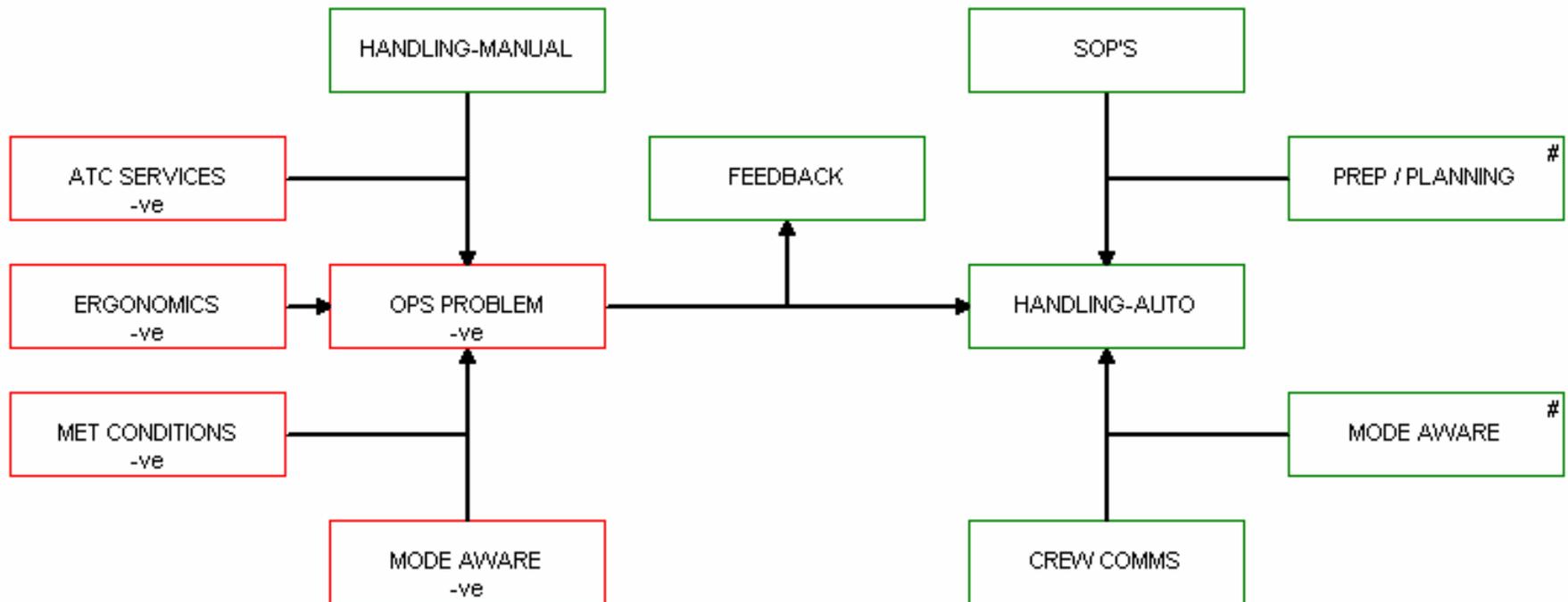
- ☞ Why?
- ☞ Environment
- ☞ Organisation
- ☞ Person

Note: Most factors can be applied in a **Positive** as well as a **Negative** sense

Simple Incident Model



Human factors analysis of a Go-around



Go-arounds: ASR Analysis

- Allows numeric comparisons of G/A frequency
 - Across locations / ATC facilities
 - Across time
 - Across a/c fleets
- Risk assessment – action prioritisation
- Little or no account of avoidance or recovery strategies
- Analysis gives a negative picture but no indication of problems with G/A

BASIS References:

Go-arounds in the first six months of 1997 and 2002

Jan – Jun 1997	G/As =	Jan – Jun 2002	G/As = 403
	440		
1. WEATHER	152	1. AERODRM/LANDING SITE	125
2. AERDRM/LANDING SITE	132	2. WEATHER	114
3. ATC	81	3. ATC	77
4. PILOT HNDLG/AIRMNSHP	53	4. PILOT HNDLG/AIRMNSHP	73
5. GPWS	34	5. FLIGHT CONTROLS	22
6. FLIGHT CONTROLS	19	6. GPWS	20
7. AUTOFLIGHT	14	7. LANDING GEAR	11
8. LANDING GEAR	8	8. CABIN EQUIPMENT	4
9. CABIN EQUIPMENT	4	9. NAV EQUIPMENT	2
10. AIRPROX	1	10. FUEL	1

BASIS References are not necessarily causal – just

‘associated’.

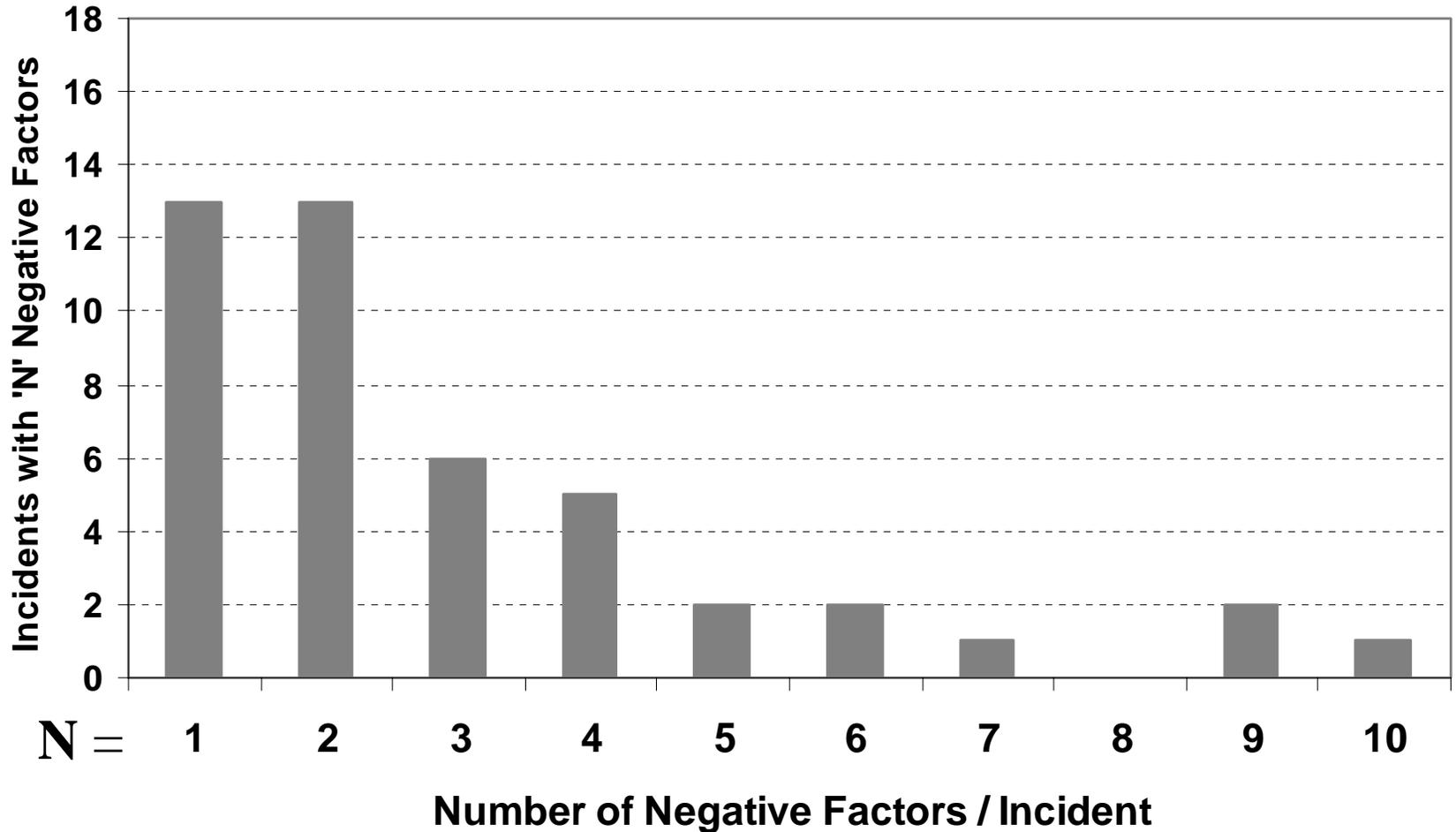
Go-arounds: HFR Analysis

- ➡ HFR data gives a more balanced picture
- ➡ Account of avoidance or recovery strategies
- ➡ Focus on causal analysis allows development of effective training programmes
- ➡ No risk assessment
- ➡ No useful numeric comparisons of G/A frequency (location, time, fleets etc.)

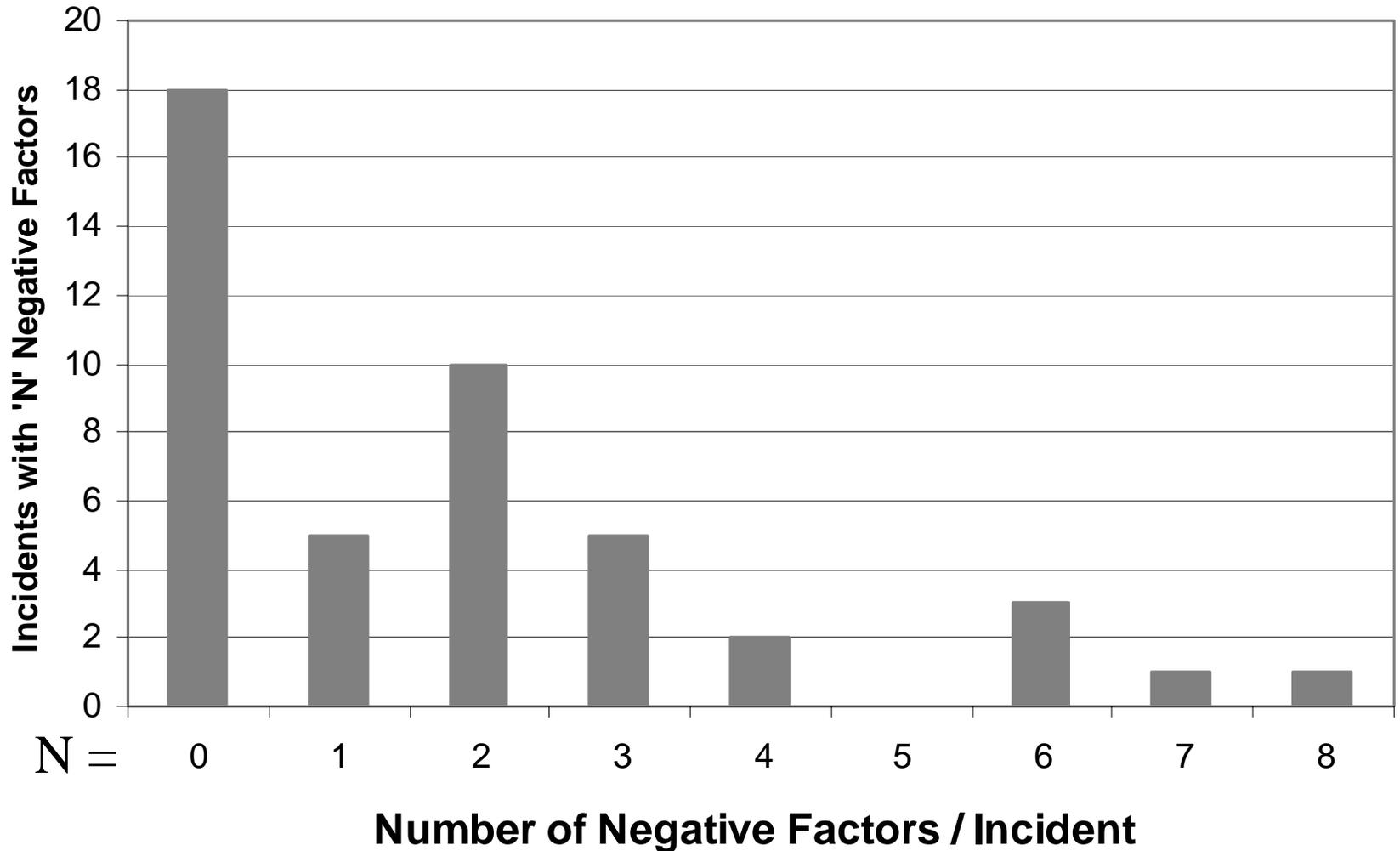
HFR study details

- 👉 April to early June 2002. A total of 132 HFR questionnaires were sent out covering 66 go-arounds
- 👉 Fifty- four replies were received representing a return rate of just over 40%.
- 👉 Much higher rate than normal
- 👉 54 replies concerned 45 go-arounds

Number of Negative Factors / Incident Before Go-Around



Number of Negative Factors / Incident After Go-Around



N =

Negative human factors applied to the pre and post go-around phases

Pre Go-around	N=	Post Go-around	N=
1. ATC Services	28	1. Cross-Checking	11
2. Other Aircraft	23	2. Ops Stress	11
3. Met Conditions	13	3. ATC Service	8
4. Handling-Manual	8	4. Error	8
5. Airport Facilities	7	5. Handling-Manual	7
6. Prep / Planning	6	6. System Handling	5
7. Crew Comms	5	7. Prep/Plan	6
8. Mode Awareness	5	8. Currency	4
9. Ergonomics	4	9. Workload Management	3
10. Error	4	10. Training	3
Total Factors	134		81
Total incidents	45		27

Positive human factors applied to the pre and post go-around phases

Pre Go-around	N=	Post Go-around	N=
1. Prep / Planning	25	1. Handling-Auto	4
2. ATC Services	18	2. Handling-Manual	4
3. Environment Awareness	15	3. Crew Comms	3
4. Crew Comms	12	4. Assertiveness	2
5. Mode Awareness	10	5. Role Conformity	2
6. Handling-Manual	8	6. System Handling	1
7. Currency	5		
8. Handling-Auto	5		
9. SOPs	5		
10. Workload Management	4		
Total Factors	118		15
Total incidents	38		11

‘Preparation & Planning’ vs. Go-around Outcome

		PREPARATION & PLANNING		
		Positive 27	Negative 11	Not Assessed 16
O U T C O M E	Positive 32	23	1	8
	Negative 18	4	10	4
	Not Assessed 4	0	0	4

Conclusions

- ➡ ASR and HFR can work together effectively
- ➡ ASR provides a broad authoritative overview
- ➡ HFR offers valuable detail and can surprise
 - ➡ 3% reported difficulty with G/A in ASR
 - ➡ ~60% indicated some difficulty in HFR
- ➡ Jim Reason was right
 - ➡ The more ways you have of looking at a problem, the better the view.